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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,853	09/15/2003	Nelson A. Kelly	GP-303074	2134

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EXAMINER

ZHENG, LOIS L

ART UNIT PAPER NUMBER

1742

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/662,853

Applicant(s)

KELLY ET AL.

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Status***

1. Claims 20 and 23 are amended in view of the amendment filed on 26 August 2005. Therefore, claims 20-37 remain under examination.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 20-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayers in view of Deng.

The teachings of Ayers in view of Deng are discussed in paragraph 5 of the previous Non-Final Office Action mailed 26 May 2005. The rejection ground is maintained for the same reason as stated in the previous Office Action.

With respect to the amended feature of "a corrosion resistant indium tin oxide(ITO) layer" as recited in instant claims 20 and 23, the ITO layer coated on the electrode in the photoelectrochemical apparatus of Ayers in view of Deng is inherently corrosion resistant as claimed since Ayer in view of Deng teaches that the ITO layer is greater than 3000 Angstroms as claimed.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 20 and 23 have been considered but are not persuasive.

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In the remarks, applicant argues that the claimed thickness of greater than 3000 Angstroms as taught by the instant invention provides unexpected corrosion protection effect.

After careful review of the applicant's specification (paragraphs 34-48, Tables 1-2 and Figs. 2-3), the examiner concludes that ITO coatings #3 and #9 meets the limitation of the instant claims. The significantly longer time that the ITO coatings #3 and #9 experience prior to failure as shown in Fig. 2 are result of satisfying multiple conditions such as coating thickness of greater than 3000 Angstroms and sputtering at temperature of at least 200°C for at least 30 minutes in a non-oxidizing environment as recited in instant claims 20 and 25. Having a ITO coating with claimed thickness of greater than 3000 Angstroms alone, without having the claimed coating morphology (i.e. highly oriented film with predominantly a cubic-phase oxide and a smaller amount by weight of a hexagonal-phase oxide) which can only be produced when sputtering is taking place at temperature of at least 200°C for at least 30 minutes in a non-oxidizing environment, does not lead to significant longer timer prior to failure (See ITO coating #6) and vise versa.

More importantly, it is well known in the coating art that the thicker the coating material, the longer it takes for corrosion to reach the substrate itself. It is also well known in the coating art that the longer the coating time, the thicker the coating becomes. Therefore, one of ordinary skill in the art would have found it obvious to increase the coating time in order to produce a thicker coating for longer lasting electrodes (i.e. longer time to failure).

Therefore, examiner does not find applicant's argument regarding coating thickness persuasive.

Applicant further argues that neither Ayers nor Deng recognizes or appreciates the issue of corrosion resistance in a photolytic device and Deng teaches away from using thicker ITO coatings since Deng teaches around 65nm ITO coating is desirable in an a-Si solar cell.

The examiner does not find applicant's argument persuasive since the corrosion protection by the ITO coating to the underlying electrode is inherent since corrosion will need to eat through the ITO coating layer before reaching the core electrode. In addition, even though Deng does not explicitly teach that thicker coatings as claimed are used in an a-Si solar cell, Deng does teach that thicker ITO coating as claimed can be prepared (Table 1, left column of page 701). Therefore, one of ordinary skill in the art would have found it obvious to have produced a thicker ITO coating as taught by Deng on the electrode of Ayers in order to produce a longer lasting electrode as stated above.

Applicant further argues that Deng is silent about particular morphology of the ITO coating.

The examiner does not find applicant's argument persuasive because Deng provides examples of thicker ITO coatings (greater than 3000 Angstroms), produced under the same process conditions as those of the instant invention, in Table 1, left column of page 701 (i.e. substantially the same coating temperature range, coating duration, RF sputtering wattage and vacuum chamber pressure). Therefore, the ITO

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coating as taught by Deng inherently has the same physical morphology as claimed ITO coating layer.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

  
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